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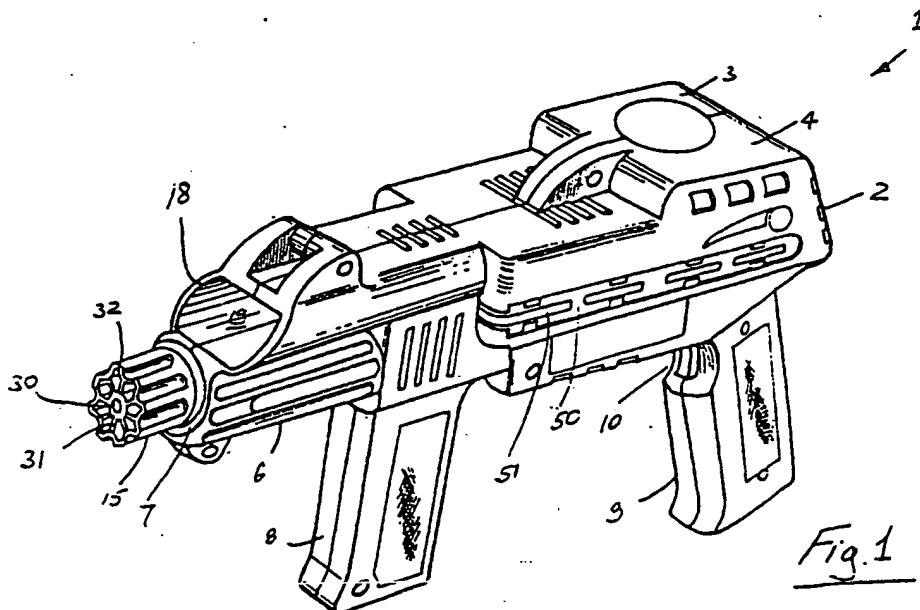
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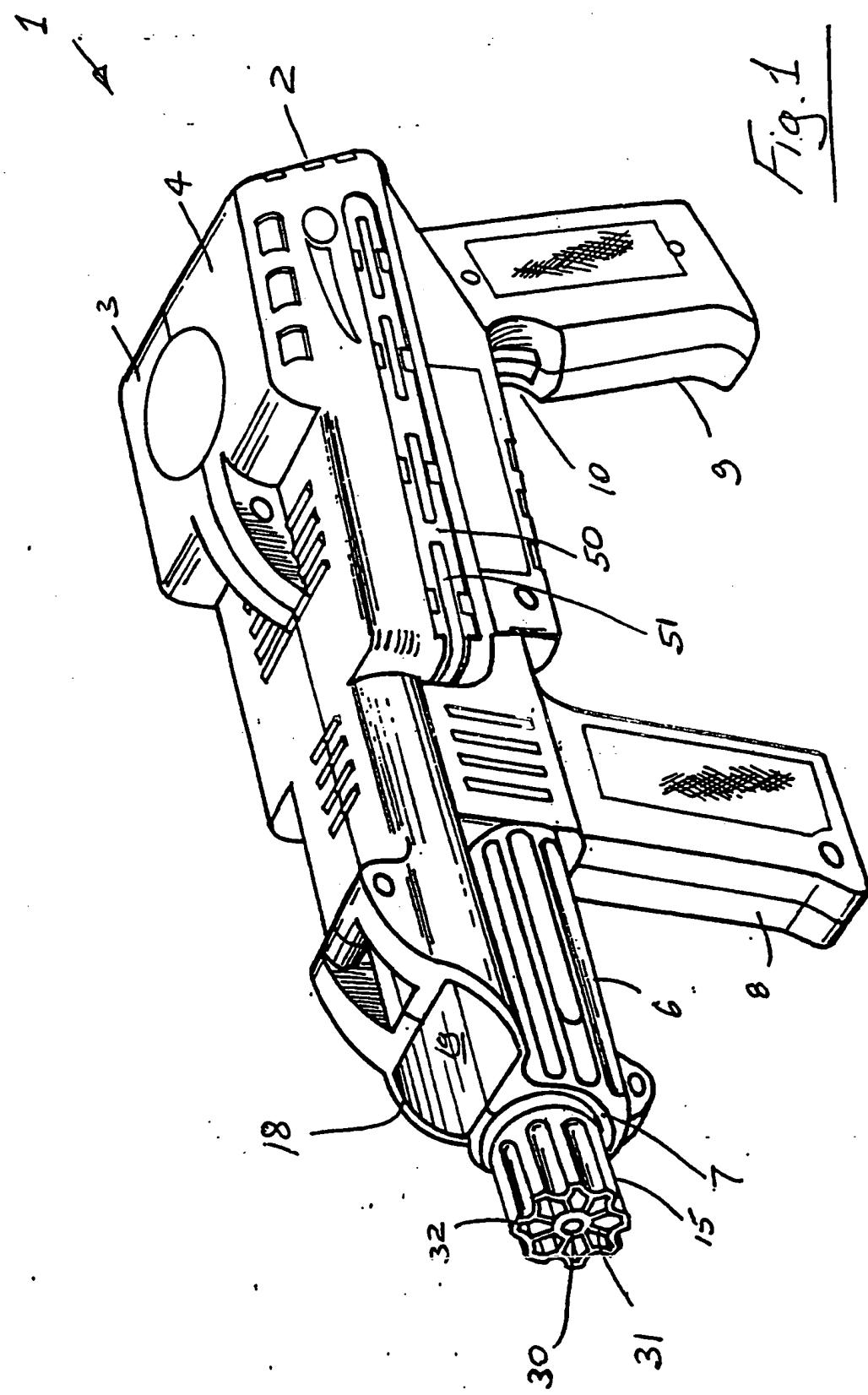
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## (54) Gun apparatus for an electronic shooting game

(57) A gun apparatus for an electronic shooting game comprises a two part gun body (2) having a primary barrel (6), a secondary barrel (18), hand grips (8, 9) and a trigger mechanism (10). An infra red emitter is mounted in the secondary barrel (18) and a laser is mounted in the primary barrel (6) which are both operated on activation of the trigger (10) to emit a narrow focused beam of high intensity visible light and an invisible infra red beam, respectively. A resilient deformable tip (15) is provided at a front end of the barrel (6). The gun body is also provided with targets in the form of infra red receptors which provide signals to a microprocessor in the gun which counts and records the number of times a player is hit. Targets may be provided on body armour and connected to the microprocessor.



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Fig. 1

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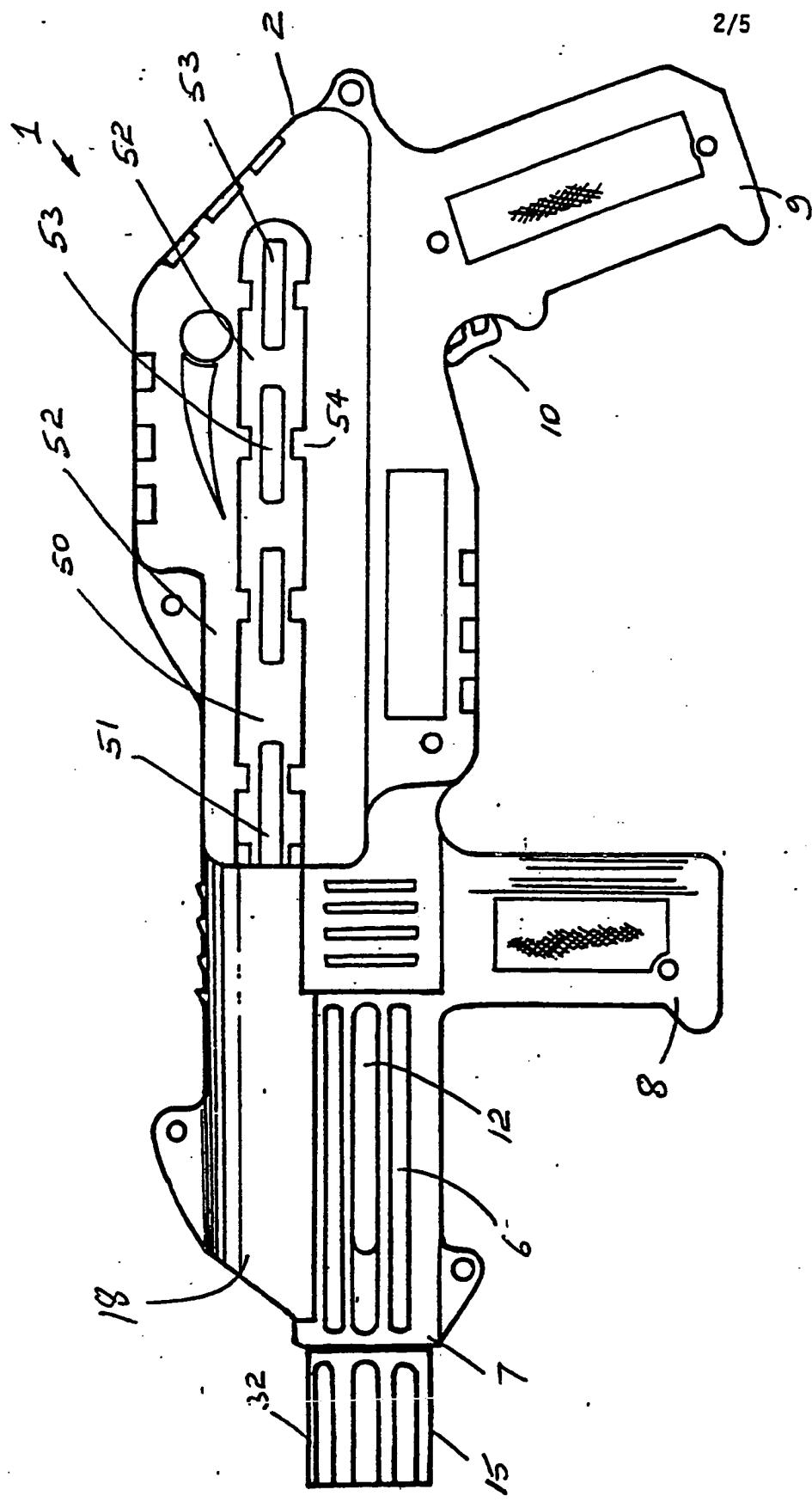


Fig. 2

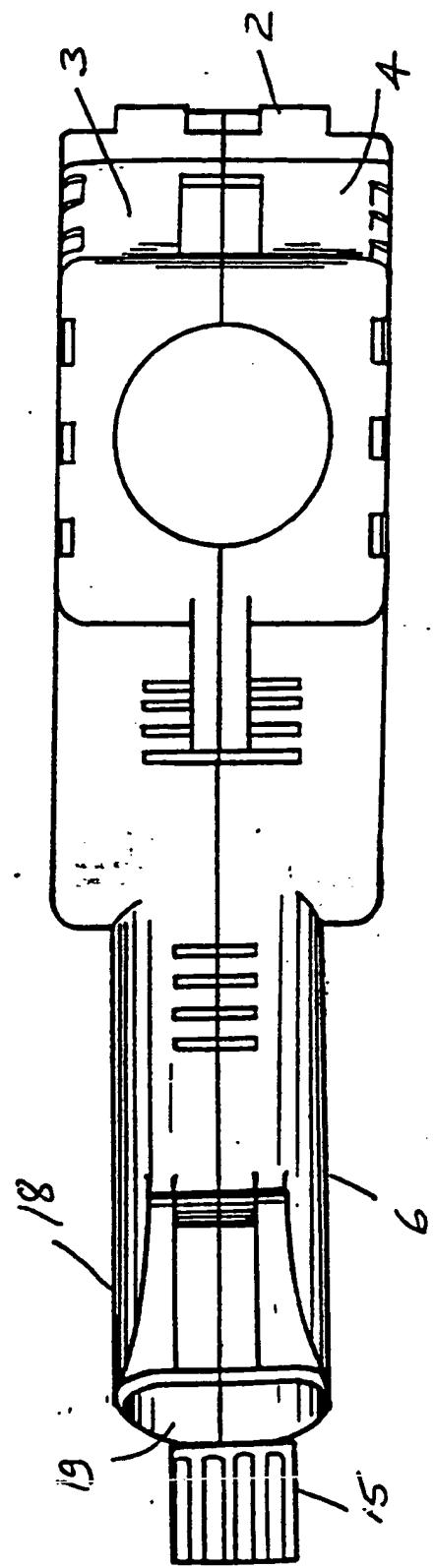
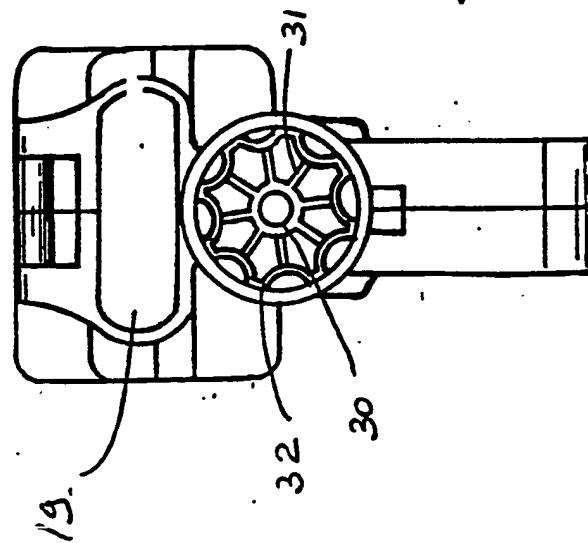
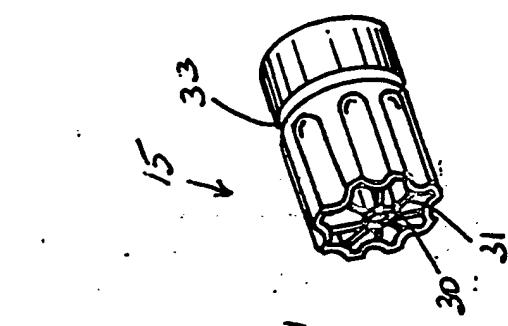
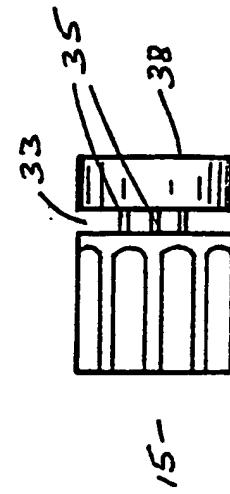
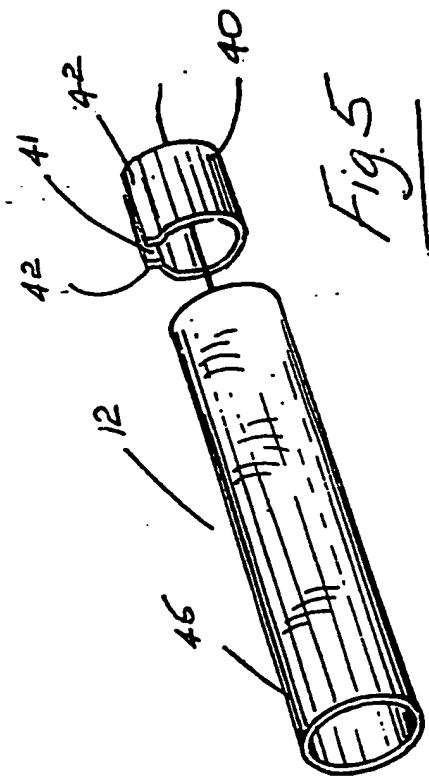


Fig. 3



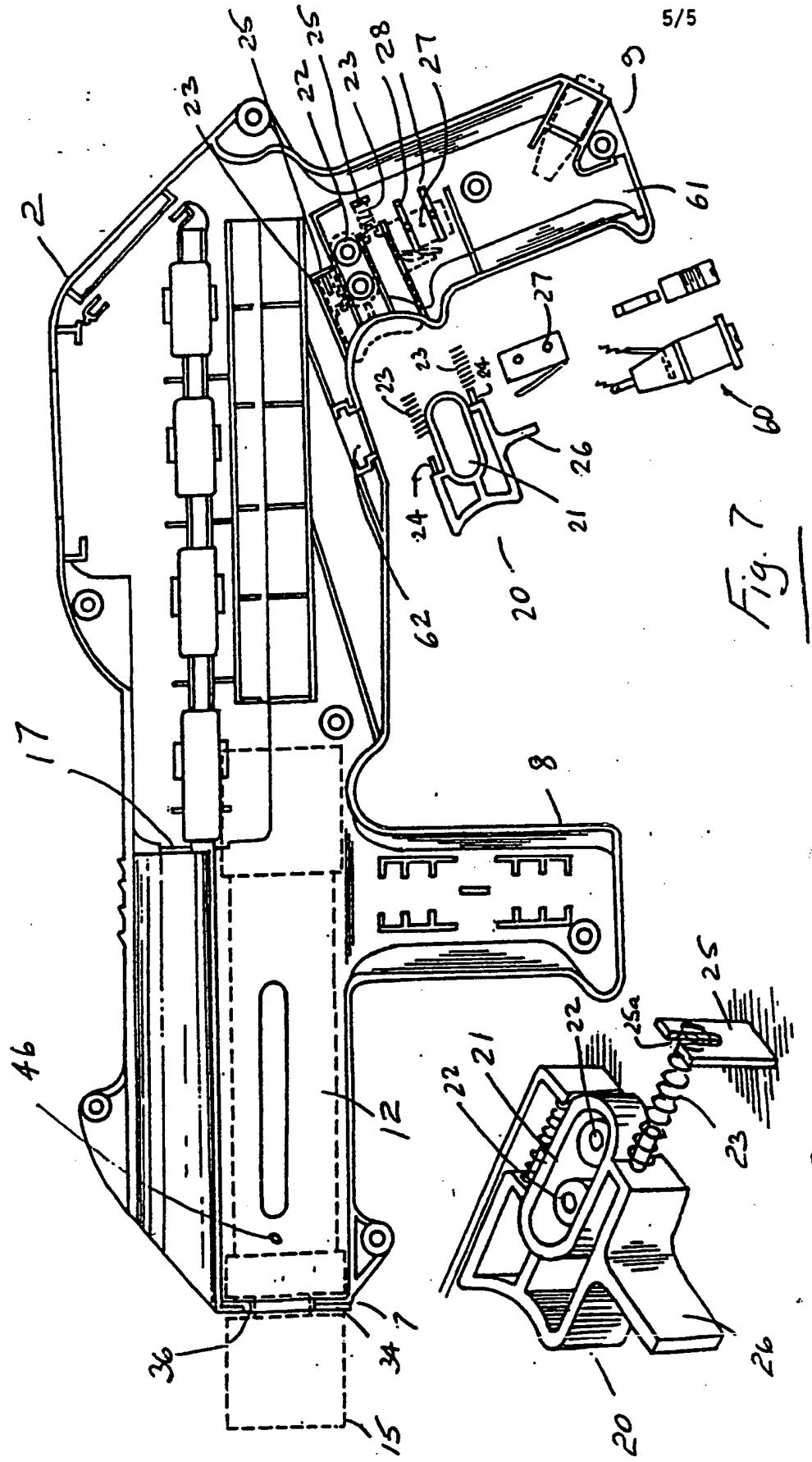


Fig. 7

"Gun Apparatus for an Electronic Shooting Game"

The invention relates to a gun apparatus for an electronic shooting game. More particularly, the invention relates to a gun apparatus for use in an electronic shooting game of the type played between two teams of one or more players in which the players compete in a battle environment and shoot at opponents while trying to avoid being shot at themselves.

It is an object of the invention to provide an improved gun apparatus for use in an electronic shooting game which is reliable in operation whilst at the same time facilitating quick and efficient manufacturing.

According to the invention there is provided a gun apparatus for use in an electronic shooting game of the type played between two teams of one or more players in which the players compete in a battle environment and shoot at opponents while trying to avoid being shot at themselves, the gun apparatus comprising a gun body having a first barrel, a hand grip, and a trigger mechanism adjacent to the hand grip, the gun having a power supply, a beam transmitting means in the gun for emitting a narrow focused beam of high intensity light when the gun is fired, processing means for collecting data from a target and for counting and recording the number of times that a player has been hit on the target.

In one embodiment of the invention a resiliently deformable tip is provided at the front end of the first barrel. Typically the deformable tip comprises an outer sidewall and an inner tube connected to the outer sidewall by deformable radial webs extending therebetween. Preferably the deformable tip includes mounting means for mounting the tip to the end of the barrel. In a preferred

arrangement the mounting means comprises an annular slot in the sidewall of the tip engagable with a complementary annular flange at the end of the barrel. Preferably inter-engagable formations are provided on the tip and the barrel to prevent rotation of the tip on the barrel.

5 In one embodiment of the invention an inner end of the tip is engagable with the beam transmitting means to support the beam transmitting means on the barrel. Preferably a socket is formed at an inner end of the tip for releasable engagement with the beam transmitting means. Typically a resilient support is provided for mounting on the beam transmitting means to resiliently support the transmitting means between the tip and the support within the gun barrel.

10 15 In one embodiment of the invention the beam transmitting means is engagable with the barrel to lock the beam transmitting means against rotation within the barrel. Preferably a hole is provided in a sidewall of the beam transmitting means for engagement with a complementary spigot on the barrel to lock the beam transmitting means in position in the barrel.

20 25 In a particularly preferred arrangement the apparatus includes emitting means for emitting a beam of infra red. Preferably the infra red emitting means is mounted in a secondary barrel of the gun. Typically the secondary barrel is parallel to the first barrel so that the infra red beam is emitted parallel to the narrow focused beam of high intensity light. Most preferably the infra red beam initiates a hit on a target.

In one embodiment of the invention the gun includes receptors which act as a target for other players. Preferably the trigger mechanism comprises a trigger slidably mounted on the gun body and movable between an 5 extended released position and a retracted firing position, biasing means extending between the trigger and the gun body to urge the trigger towards the released position. Typically a switch is mounted on the gun body, the switch being connected to the beam transmitting means 10 and engagable by the trigger in the firing position to fire an infra red beam from the gun. Preferably the trigger has a slot engagable with a complementary guide on the body which projects through the slot for slidably supporting the trigger on the body. Ideally the biasing 15 means comprises one or more springs, each spring being mounted on a spigot on the trigger and extending to engage an associated support post on the body.

In a preferred arrangement there are two hand grips, a forward hand grip at a front end of the gun barrel and a 20 rear hand grip at a rear end of the barrel, the trigger mechanism being provided adjacent to the rear hand grip.

Preferably a window is provided in a sidewall of the gun body. Typically the window is formed by a flexible strip having a number of translucent window portions, the strip 25 locating in a slot in the sidewall and being retained therein by a number of spaced-apart lugs at opposite sides of the slot with the window portions in register with associated through holes in the sidewall. In one embodiment the gun body is divided axially into two 30 similar gun body parts into which gun elements are assembled.

In another aspect the invention provides a game apparatus comprising, for each player, a gun apparatus according to the invention and body armour, the body armour having receptors which act as a target for other players,  
5 connection means between the gun and the body armour delivering signals from the body armour receptors to the processing means.

The invention will be more clearly understood from the following description of some preferred embodiments  
10 thereof given by way of example only with reference to the accompanying drawings in which:-

- Fig. 1 is a perspective view of a gun apparatus according to the invention;
- Fig. 2 is a side elevational view of the gun;
- 15 Fig. 3 is a top plan view of the gun;
- Fig. 4 is a front elevational view of the gun;
- Fig. 5 is an exploded perspective view of portion of the gun;
- 20 Fig. 6 is an elevational view of a resilient barrel tip forming portion of the gun;
- Fig. 7 is an elevational view of one half of a body of the gun; and
- Fig. 8 is a detail perspective view of portion of a trigger mechanism of the gun.

Referring to the drawings there is illustrated a gun apparatus according to the invention indicated generally by the reference numeral 1. The gun 1 has a gun body 2 formed by two halves 3, 4 of moulded plastics material, 5 preferably ABS, secured together by bolts 5. The gun 2 has a forwardly extending primary barrel 6. A pair of hand grips are provided, namely, a front hand grip 8 and a rear hand grip 9. Mounted adjacent the rear hand grip 9 is a trigger mechanism 10. Housed within the barrel 6 10 is a laser 12 operable to emit a narrow focused beam of high intensity light through an open front end 7 of the primary barrel 6 when the gun 1 is fired. A resiliently deformable tip 15 is mounted at the front end 7 of the primary barrel 6. An infra red emitter (not shown) is 15 mounted in a slot 17 in an upper secondary barrel 18 having a front opening 19 through which an invisible beam of infra red is emitted.

The trigger mechanism 10 comprises a plastics trigger 20 slidably mounted on the gun body 2 and movable between an 20 extended released position and a retracted firing position. The trigger 20 has an elongate slot 21 (Fig. 7) engagable with a complementary guide which in this case is formed by a pair of spaced-apart spigots 22 integrally moulded with the gun body 2 which project through the slot 21 for slidably supporting the trigger 20 on the body 2. A pair of springs 23 are mounted on spigots 24 on the trigger 20 and project rearwardly to engage associated support posts 25 on the body 2, the springs being impaled 25 on the support posts 25 each of which has an upwardly open notch 25a for reception of a spring. A lug 26 on the trigger 20 is engagable with a microswitch 27 when the trigger 20 is in the firing position. The microswitch 27 is operatively connected to the laser 12 and to the infra red emitter to fire a visible laser beam and an invisible

infra red beam when the trigger is pulled. The microswitch 27 is supported and located within the rear hand grip 9 by a pair of spaced-apart posts 28.

5 It will be appreciated that the construction of the trigger mechanism 10 is such as to facilitate rapid assembly when constructing a gun 1 and to ensure smooth efficient operation of the trigger 20 in use.

10 The tip 15 is of thermoplastic material such as rubber and is generally cylindrical in shape having an inner bore 30 for through passage of a beam from the laser 12. The inner bore 30 is connected by a number of deformable radial webs 31 with an outer sidewall 32. Intermediate the ends of the outer sidewall 32 a radial slot 33 (Fig. 6) is provided engagable with a complementary annular flange 34 (Fig. 7) at the front end 7 of the barrel 6. A 15 number of radial flanges 35 within the slot 33 are engagable with complementary sockets 36 on the annular flange 34 to prevent rotation of the tip 15 on the barrel 6. A socket 38 is provided at an inner end of the tip 15 20 for releasably engaging the laser 12 to resiliently support the laser 12 within the barrel 6.

25 At an opposite end of the laser 12 a resilient end support 40 is provided of the same material as the tip 15. The end support 40 is generally cylindrical with open ends, a slot 41 extending between the ends to facilitate fitting the end support 40 on the laser 12. Flanges 42 project outwardly at each side of the slot 41 for engagement with an interior of the gun body 2 to prevent rotation of the end support 40 within the gun barrel 6. It will be 30 appreciated that the laser 12 is firmly supported between the tip 15 and the end support 40 which provide for shock absorption.

The laser 12 has a tubular outer casing 45. A register hole is provided in the casing 45 which is engagable with a spigot 46 (Fig. 7) inside the barrel 6 to prevent rotation of the laser 12 within the barrel 6. The gun body is divided axially into two similar body halves in which the various elements are associated and the body halves are then secured together.

On each side of the gun body 2 a window panel 50 is provided comprising a flexible strip having a number of translucent windows 51. The strip is seated in an associated slot 52 in the gun body with the windows 51 in register with through holes 53 in the gun body. A plurality of spaced-apart lugs 54 at each side of the slot 52 retain the strip in position. It will be appreciated that this construction facilitates rapid mounting of the strip on the gun body.

Referring now in particular to Fig. 7, a fuse holder 60 is mounted in an associated socket 61 at a lower end of the rear hand grip 9. The fuse holder 60 carries a fuse protecting the circuitry of the gun 1 which can be readily easily changed if required. In similar fashion a charge socket (not shown) is mounted in an associated socket 62 on an underside of the gun body adjacent the trigger mechanism 10. The charge socket incorporates a socket for reception of a jack plug for connection to a battery charger to recharge batteries incorporated in the gun assembly. A printed circuit board (not shown) containing the circuitry for control of the gun including a micro processing means is mounted within the gun body above the trigger mechanism and is connected to the laser 12, the charge socket, the trigger mechanism and the fuse holder by means of plug and socket type connectors thus facilitating rapid assembly of the gun and the replacement of any parts which require maintenance during use. The

printed circuit board also allows these connections to be soldered, if required.

5 The gun includes targets in the form of infra red receptors which are activated when hit by an infra red beam emitted from the gun of an opposing player. Signals from the receptors are collected by the microprocessor which counts and records the number of times that a player has been hit by an opposing player.

10 The gun forms part of a game apparatus which is carried by a player. The other part is body armour which is worn by the player and which is also provided with targets in the form of infra red receptors. The body armour has cables which connect with the gun and deliver signals to and from the microprocessor mounted in the gun body.

15 Many variations on the specific embodiment of the invention described will be readily apparent and accordingly the invention is not limited to the embodiment hereinbefore described which may be varied in construction and detail.

CLAIMS

1. A gun apparatus for use in an electronic shooting game of the type played between two teams of one or more players in which the players compete in a battle environment and shoot at opponents while trying to avoid being shot at themselves, the gun apparatus comprising a gun body having a first barrel, a hand grip, and a trigger mechanism adjacent to the hand grip, the gun having a power supply, a beam transmitting means in the gun for emitting a narrow focused beam of high intensity light when the gun is fired, processing means for collecting data from a target and for counting and recording the number of times that a player has been hit on the target.  
5
2. A gun apparatus as claimed in claim 1 wherein a resiliently deformable tip is provided at the front end of the first barrel.  
10
3. A gun apparatus as claimed in claim 2 wherein the deformable tip comprises an outer sidewall and an inner tube connected to the outer sidewall by deformable radial webs extending therebetween.  
15
4. A gun apparatus as claimed in claims 2 or 3 wherein the deformable tip includes mounting means for mounting the tip to the end of the barrel.  
20
5. A gun apparatus as claimed in claim 4 wherein the mounting means comprises an annular slot in the sidewall of the tip engagable with a complementary annular flange at the end of the barrel.  
25

6. A gun apparatus as claimed in any of claims 2 to 5 wherein inter-engagable formations are provided on the tip and the barrel to prevent rotation of the tip on the barrel.

5 7. A gun apparatus as claimed in any of claims 2 to 6 wherein an inner end of the tip is engagable with the beam transmitting means to support the beam transmitting means on the barrel.

10 8. A gun apparatus as claimed in claim 7 wherein a socket is formed at an inner end of the tip for releasable engagement with the beam transmitting means.

15 9. A gun apparatus as claimed in claims 7 or 8 wherein a resilient support is provided for mounting on the beam transmitting means to resiliently support the transmitting means between the tip and the support within the gun barrel.

20 10. A gun apparatus as claimed in any preceding claim wherein the beam transmitting means is engagable with the barrel to lock the beam transmitting means against rotation within the barrel.

25 11. A gun apparatus as claimed in claim 10 wherein a hole is provided in a sidewall of the beam transmitting means for engagement with a complementary spigot on the barrel to lock the beam transmitting means in position in the barrel.

12. A gun apparatus as claimed in any preceding claim including emitting means for emitting a beam of infra red.

13. A gun apparatus as claimed in claim 12 wherein the infra red emitting means is mounted in a secondary barrel of the gun.
14. A gun apparatus as claimed in claim 13 wherein the 5 secondary barrel is parallel to the first barrel so that the infra red beam is emitted parallel to the narrow focused beam of high intensity light.
15. A gun apparatus as claimed in any of claims 12 to 14 wherein the infra red beam initiates a hit on a target.
- 10 16. A gun apparatus as claimed in any preceding claim wherein the gun includes receptors which act as a target for other players.
- 15 17. A gun apparatus as claimed in any preceding claim wherein the trigger mechanism comprises a trigger slidably mounted on the gun body and movable between an extended released position and a retracted firing position, biasing means extending between the trigger and the gun body to urge the trigger towards the released position.
- 20 18. A gun apparatus as claimed in claim 17 wherein a switch is mounted on the gun body, the switch being connected to the beam transmitting means and engagable by the trigger in the firing position to fire an infra red beam from the gun.
- 25 19. A gun apparatus as claimed in claim 18 wherein the trigger has a slot engagable with a complementary guide on the body which projects through the slot for slidably supporting the trigger on the body.

20. A gun apparatus as claimed in claim 18 or claim 19 wherein the biasing means comprises one or more springs, each spring being mounted on a spigot on the trigger and extending to engage an associated support post on the body.
- 5
21. A gun apparatus as claimed in any preceding claim wherein there are two hand grips, a forward hand grip at a front end of the gun barrel and a rear hand grip at a rear end of the barrel, the trigger mechanism being provided adjacent to the rear hand grip.
- 10
22. A gun apparatus as claimed in any preceding claim wherein a window is provided in a sidewall of the gun body.
23. A gun apparatus as claimed in claim 22 wherein the window is formed by a flexible strip having a number of translucent window portions, the strip locating in a slot in the sidewall and being retained therein by a number of spaced-apart lugs at opposite sides of the slot with the window portions in register with associated through holes in the sidewall.
- 15
24. A gun apparatus as claimed in any preceding claim wherein the gun body is divided axially into two similar gun body parts into which gun elements are assembled.
- 20
25. A gun apparatus substantially as hereinbefore described with reference to the accompanying drawings.
- 25

26. A game apparatus comprising, for each player, a gun apparatus as claimed in any preceding claim and body armour, the body armour having receptors which act as a target for other players, connection means between the gun and the body armour delivering signals from the body armour receptors to the processing means.
- 5
27. A game apparatus substantially as hereinbefore described with reference to the drawings.

Relevant Technical fields		Search Examiner
(i) UK CI (Edition K )	F3C CTE, CTM, CTN A6H H7	PAUL GAVIN
(ii) Int CI (Edition 5 )	F41J A63B A63F	
<b>Databases (see over)</b>		Date of Search
(i) UK Patent Office		5 FEBRUARY 1993
(ii) ONLINE WPI		

Documents considered relevant following a search in respect of claims 1 AT LEAST

Category (see over)	Identity of document and relevant passages		Relevant to claim(s)
X	GB 2216813 A	(HASLEHURST) - whole document	1 at least
X	GB 2200732 A	(TOMY) - whole document	1 at least
X	GB 2169995 A	(SHORTALL) - whole document	1 at least
X	GB 2153498 A	(PHOTON) - whole document	1 at least
X	GB 2115708 A	(McNULTY) - whole document	1 at least
X	EP 0231066 A1	(FUTURISTIC)	1 at least
	US 4586715	(LIFE LIGHT)	1 at least

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